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Date: August 3, 2004

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Your Reference: U.S. Application No. 09/778,043

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Number of Pages 9  
Including Cover:

Message

U.S. Patent Application Serial No. 09/778,043  
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1. (Currently Amended) A cigarette filter comprising an intermetallic compound reagent which binds with a gaseous component of a gas stream to remove said gaseous component from said gas stream.
2. (Currently Amended) The cigarette filter according to claim 1, wherein the filter ~~comprises a cigarette filter~~ is attached to a tobacco rod by tipping paper or the intermetallic compound reagent is incorporated in one or more cigarette filter parts selected from the group consisting of shaped paper insert, a plug, a space, or a free-flow sleeve.
3. (Currently Amended) The cigarette filter according to claim 1, wherein the intermetallic compound reagent selectively binds to unsaturated hydrocarbons in the gas stream.
4. (Currently Amended) The cigarette filter according to claim 1, wherein the intermetallic compound reagent comprises nanometer or micrometer size clusters of a transition metal or alloy containing a transition metal or a transitional metal salt.
5. (Currently Amended) The cigarette filter according to claim 1, wherein the gaseous component to be removed from said ~~smoke~~ gas stream is 1,3-butadiene.
6. (Currently Amended) The cigarette filter according to claim 4, wherein said intermetallic compound reagent is incorporated in cigarette filter paper located

within a free-flow filter, the filter paper optionally having a three-dimensional shape and/or the filter paper being a liner on the interior of a hollow tubular element.

7. (Currently Amended) The cigarette filter according to claim 1, wherein said intermetallic compound reagent is incorporated with cellulose acetate fibers and/or polypropylene fibers forming a plug or a free-flow filter element.

8. (Currently Amended) The cigarette filter according to claim 4, wherein said intermetallic compound reagent is incorporated in or on a support material.

9. (Original) The cigarette filter according to claim 8, wherein said support material comprises silica gel, porous carbon or a zeolite.

10. (Currently Amended) The cigarette filter according to claim 4, wherein said ~~transition~~ transition metal includes iron and/or titanium.

11. (Currently Amended) The cigarette filter according to claim 1, wherein said intermetallic compound reagent comprises nanometer or micrometer size clusters of an iron aluminide or a titanium aluminide.

12. (Currently Amended) The cigarette filter according to claim 1, wherein a metal atom of the intermetallic compound reagent binds to a C-H bond and/or a C-C bond of the gaseous component.

13. (Currently Amended) A method of manufacturing a cigarette filter which is useful for removing a gaseous component of a gas stream, comprising incorporating an intermetallic compound reagent in a cigarette filter, the intermetallic compound reagent being effective to bind with a gaseous component of a gas stream sufficiently to selectively remove the gaseous component from the gas stream.

14. (Currently Amended) The method according to claim 13, further comprising attaching the cigarette filter to a tobacco rod with tipping paper or the intermetallic compound reagent is incorporated in one or more cigarette filter parts selected from the group consisting of shaped paper insert, a plug, a space, or a free-flow sleeve.

15. (Currently Amended) The method according to claim 14, further comprising ~~a step of~~ attaching the filter paper within a free-flow filter of a cigarette such as by forming said filter paper into a three-dimensional shape or attaching said filter paper as a liner on the interior of a hollow tubular element or combining said intermetallic compound reagent with fibers and forming a filter element from said intermetallic compound reagent and fibers or combining said intermetallic compound reagent with cellulose and/or polypropylene fibers and forming a plug or free-flow filter element or incorporating said intermetallic compound reagent in a cavity of said filter.

16. (Previously Presented) The method according to claim 13, wherein the intermetallic compound reagent is effective for removing unsaturated hydrocarbons including 1,3-butadiene, isoprene and/or toluene from the gas stream.

17. (Previously Presented) The method according to claim 13, wherein the intermetallic compound reagent comprises nanometer or micrometer size clusters of a transition metal or alloy containing a transition metal or a transitional metal salt.

18. (Currently Amended) The method according to claim 17, further comprising ~~a step of~~ loading said intermetallic compound reagent in or on a support material forming a filter element of the cigarette filter.

19. (Original) The method according to claim 13, wherein the support material comprises silica gel, porous carbon or a zeolite.

20. (Currently Amended) A method of removing a gaseous component from a gas stream, comprising passing the gas stream in contact with a cigarette filter comprising an intermetallic compound reagent which binds with a gaseous component of the gas stream and removes said gaseous component from the gas stream.

21. (Currently Amended) The method according to claim 20, further comprising steps of forming the gas stream by burning tobacco and directing tobacco smoke through the cigarette filter such that the component of the gas stream

to be removed is brought into contact with the intermetallic compound reagent and prevented from reentering the gas stream.

22. (Previously Presented) The method according to claim 21, wherein the intermetallic compound reagent is incorporated in one or more cigarette filter parts selected from the group consisting of filter paper, shaped paper insert, a plug, a space, or a free-flow sleeve, the tobacco smoke being passed through the one or more filter parts.

23. (Previously Presented) The method according to claim 20, wherein the intermetallic compound reagent is effective to selectively remove unsaturated hydrocarbons present in the gas stream.

24. (Previously Presented) The method according to claim 20, wherein the intermetallic compound reagent comprises nanometer or micrometer size clusters of a transition metal or alloy containing a transition metal or a transitional metal salt.

25. (Original) The method according to claim 20, wherein the cigarette filter removes 1,3-butadiene from the cigarette smoke.

26. (Currently Amended) The method according to claim 20, wherein the intermetallic compound reagent is incorporated in or on a support material selected from the group consisting of silica gel, porous carbon or and a zeolite.

27. (Currently Amended) The method according to claim 26, wherein said silica gel has an average particle diameter of at least 10  $\mu\text{m}$  or said silica gel is in the form of particles having a mesh size of at least 60 and said ~~tobacco-smoke gas stream~~ is passed through a mass of particles of said silica gel.

28. (Original) The method according to claim 26, wherein said silica gel is incorporated with cellulose acetate fibers and/or polypropylene fibers and the ~~tobacco-smoke gas stream~~ is a smoke stream from a burning cigarette.

29. (Previously Presented) The method according to claim 20, wherein a metal atom of the intermetallic compound reagent binds to a C-H bond and/or a C-C bond of the gaseous component.

30. (Previously Presented) The filter according to Claim 1, wherein the intermetallic compound reagent is a non-oxide intermetallic compound reagent or a crystalline intermetallic compound reagent.

31. (Previously Presented) The method according to Claim 13, wherein the intermetallic compound reagent is a non-oxide intermetallic compound reagent or a crystalline intermetallic compound reagent.

32. (Currently Amended) ~~A filter comprising a metal reagent which binds with a gaseous component of a gas stream to remove said gaseous component from said gas stream,~~ The cigarette filter according to claim 1, wherein the metal

intermetallic compound reagent comprises nanometer or micrometer size clusters of a transition metal or alloy containing a transition metal or a transitional metal salt and ~~the metal reagent is incorporated in cigarette filter paper located within a free-flow filter, the filter paper optionally having a three dimensional shape and/or the filter paper being a liner on the interior of a hollow tubular element.~~

33. (Currently Amended) ~~A method of removing a gaseous component from a gas stream, comprising passing the gas stream in contact with a cigarette filter comprising a metal reagent which binds with a gaseous component of the gas stream and removes said gaseous component from the gas stream, The method~~ according to claim 20, wherein the metal intermetallic compound reagent is incorporated in or on a support material selected from the group consisting of silica gel, porous carbon and a zeolite and ~~said silica gel has an average particle diameter of at least 10  $\mu$ m, or said silica gel is in the form of particles having a mesh size of at least 60 and the gas stream is passed through a mass of particles of the silica gel.~~

34. (Currently Amended) ~~A method of removing a gaseous component from a gas stream, comprising passing the gas stream in contact with a filter comprising a metal reagent which binds with a gaseous component of the gas stream and removes said gaseous component from the gas stream, The method~~ according to claim 20, wherein the metal reagent is incorporated in or on a support material selected from the group consisting of silica gel, porous carbon and a zeolite and ~~said silica gel is incorporated with cellulose acetate fibers and/or polypropylene fibers, and the gas stream is a smoke stream from a burning cigarette.~~



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35. (Cancelled)

36. (Currently Amended) A cigarette, comprising:  
the cigarette filter according to claim ~~35~~ 1; and  
a tobacco rod attached to the filter by tipping paper.

37. (Cancelled)

38. (Currently Amended) A cigarette, comprising:  
the cigarette filter according to claim ~~37~~ 4; and  
a tobacco rod attached to the filter by tipping paper.

39. (Cancelled)

40. (Currently Amended) A cigarette, comprising:  
the cigarette filter according to claim ~~38~~ 11 and  
a tobacco rod attached to the filter by tipping paper.